

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

First Named
Inventor : Victor ChiSiang Choo

Appln. No. : 10/791,051

Filed : March 2, 2004

For : CLAMP OR CLAMP ASSEMBLY HAVING
A LOW PROFILE

Docket No.: S104.12-0048 / STL11375.00

Appeal No. ---

Group Art Unit: 3729

Examiner: Paul D. Kim

BRIEF FOR APPELLANT

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

**Electronically Filed
December 21, 2009**

This is an appeal from the Office Action dated March 5, 2009 in which claims 17-19, 21-23, 25-29, 31-33, 35, 38 and 41-44 were finally rejected or objected to.

REAL PARTY IN INTEREST

Seagate Technology LLC, a corporation organized under the laws of the State of Delaware, and having offices at 920 Disc Drive, Scotts Valley, California 95066, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment filed with the patent application and recorded on Reel 015825, frame 0101.

RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, judicial proceedings or interferences, known to the appellant that are related to, directly affected by, or that have bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

I. Total number of claims in the application.

Claims in the application are: 17-19, 21-23, 25-29, 31-33, 35, 38
and 41-44

II. Status of all the claims.

A.	Claims cancelled:	1-16, 20, 24, 30, 34, 36-37, 39-40
B.	Claims withdrawn but not cancelled:	none
C.	Claims pending:	17-19, 21-23, 25-29, 31-33, 35, 38 and 41-44
D.	Claims allowed:	none
E.	Claims rejected:	21-23, 25-29, 32, 33, 35, 38 and 41-44
F.	Claims Objected to:	17-19 and 31

III. Claims on appeal

The claims on appeal are: 17-19,
21-23, 25-29, 31-33, 35, 38 and 41-44

STATUS OF AMENDMENTS

There are no amendments after final.

SUMMARY OF CLAIMED SUBJECT MATTER

The present application relates to a method for installing a clamp over a clamping interface as recited in independent claims 21, 26 and 28. As set forth in claim 21, the method includes a step of supplying an outward force in a first direction as illustrated by arrow 174 in FIG. 6A. (Applicant's specification, page 5, lines 12-22) The outward force in direction 174 is supplied via contacting engagement of an assembly tool 176 against an inner portion of the clamp 130 to

enlarge an opening defined by the clamp as comparatively shown in FIGS. 6A and 6B. (Applicant's specification, page 6, lines 1-4).

Additionally, claim 21 requires supplying a clamping force in a second direction 172 generally transverse to the first direction 174 to disengage an inner portion of the clamp from the assembly tool, thereby reducing the opening to install the clamp over a flange of the clamping interface 132. As shown, force in the first direction 174 enlarges the opening of the clamp so that the clamp fits over flange and the force in the second direction 172 releases the clamp from the assembly tool to allow the clamp to snap into place in groove 136. (Applicant's specification, page 5, lines 12-22 and page 6, lines 1-4).

Claim 26 similarly relates to a method including a step of supplying an outward force in a first direction 174 to an inner portion of a clamp via an assembly tool as illustrated in FIG. 6A as previously described. In addition, claim 26 recites releasing the clamp from the assembly tool by supplying a clamping force in a second direction 172 different from first direction 174 and towards the clamping interface 132 to install the clamp into the recessed groove 136 of the clamping interface 132. (Applicant's specification, page 5, lines 12-22 and page 6, lines 1-4).

Claim 28 recites method steps including positioning a clamp 130 proximate to a spindle assembly as shown in FIGS. 6A and 6B. The method includes supplying an outward force in a first direction as illustrated by arrow 174 to an inner portion of the clamp 130. (Applicant's specification, page 5, lines 12-22). In addition, claim 28 recites supplying a clamping force in a second direction (different from the first direction 174) as illustrated by arrow 172 along an inverted portion 134 of the clamp and installing the inverted portion 134 of the clamp into recessed groove 136 as shown in FIG. 6B. (Applicant's specification, page 5, lines 12-22 and page 6, lines 1-4).

As required by 37 C.F.R. § 41.37(c)(1)(v), a concise explanation of the subject matter defined in the independent claims involved in the appeal is provided herein. Appellant notes that representative subject matter is identified for these claims; however, the abundance of supporting subject matter in the application prohibits identifying all textual and diagrammatic references to each claimed recitation. Appellant thus submits that other application subject matter, which supports the claims but is not specifically identified above, may be found elsewhere in the

application. Appellant further notes that this summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to the appended claims and their legal equivalents for a complete statement of the invention.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- I. Whether claims 7-9 and 31 are properly objected to as being allowable if rewritten to overcome the rejections under 35 U.S.C. § 112?
- II. Whether claim 21 is anticipated by Ng, U.S. Patent No. 7,215,509?
- III. Whether claim 26 is anticipated by Ng, U.S. Patent No. 7,215,509?
- IV. Whether claim 41 is anticipated by Ng, U.S. Patent No. 7,215,509?
- V. Whether claim 42 is anticipated by Ng, U.S. Patent No. 7,215,509?
- VI. Whether claim 43 is anticipated by Ng, U.S. Patent No. 7,215,509?
- VII. Whether claim 28 is anticipated by Ng, U.S. Patent No. 7,215,509?
- VIII. Whether claim 44 is anticipated by Ng, U.S. Patent No. 7,215,509?

ARGUMENT

- I. The Office Action fails to provide a *prima facie* basis to object to claims 17-19 and 31 under 35 U.S.C. § 112.**

On page 4 of the Office Action dated March 5th, 2009, claims 17-19 and 31 are indicated to be allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, 2nd. The Final Office Action of March 5 contains no rejection of claims 17-19 and 31 under 35 U.S.C. § 112, 2nd. Further claims 17-19 and 31 are not rejected U.S.C. § 112, 2nd in prior Office Actions and thus, the objection to claims 17-19 and 31 on the basis of 35 U.S.C. § 112, 2nd is not supported by the Office Action and must be withdrawn.

- II. Claim 21 is not anticipated by Ng**

Claim 21 is rejected under 35 U.S.C. § 102(e) as being anticipated by Ng, U.S. Patent

No. 7,215,509.

Claim 21 recites a method comprising *inter alia*:

supplying an outward force in **a first direction** . . . to enlarge an opening defined by the clamp; and

supplying a **clamping force in a second direction generally transverse to the first direction to disengage the inner portion of the clamp** from the assembly tool, **thereby reducing the opening to install the clamp over a flange** of a clamping interface.

To establish a *prima facie* basis that a claim is anticipated under 35 U.S.C. § 102, each of the claim elements must be expressly or inherently taught by the prior art reference. MPEP § 2131. Further, the prior art reference must also disclose each of the required elements **arranged as in the claims**. *Net MoneyIN Inc. v. VeriSign Inc.* 88 USPQ.2d 1751 (Fed. Cir. 2008).

In the Office Action, claim 21 is rejected on the basis that Ng teaches supplying an outward force in a first direction (194 – downward Y-direction) and supplying a clamping force in a second direction (196, X-direction) generally transverse to the first direction to disengage the inner portion of the clamp from the assembly tool, thereby reducing the opening to install the clamp over a flange of a clamping interface as shown in FIGS. 10-12 (see also col. 7, lines 13 – col. 8, line 38). Further, the Examiner notes that in FIG. 9, "[a]fter the clamp is supplied outward force [sic] in the first Y-direction, the clamp is fitted by supplying the clamping force in the second X-direction, which the clamp is fitted in the slot as shown in FIG. 10". Office Action, page 5. The conclusions set forth in the Office Action are not supported by Ng. Ng does not teach nor suggest each of the recited claim elements as arranged in claim 21 and therefore the Office Action fails to set forth a *prima facie* basis to reject claim 21.

Ng discloses a process for installing a clamp as illustrated in FIGS. 8-12. The process includes applying a deflection force F_i in a y-direction (194) to the clamp while retention portion 192 holds the disc clamp in a fixed position as illustrated in FIGS. 8-9. (Ng, col. 7, lines 32-38). In addition to supplying an outward force in **a first direction**, claim 21 requires a clamping force in a second direction transverse to the first direction to **disengage** the inner portion of the clamp thereby reducing the opening to install the clamp. Ng discloses a deflection

force F_i in the y-direction, but does not teach the required clamping force in the second direction transverse to first direction as claimed.

i. FIGS. 8-9 do not teach the clamping force in the second direction as required by claim 24

As discussed above, FIG. 8-9 illustrates application of a deflection force F_i while the retention portion 192 holds the disc clamp in a fixed position. Ng, col. 7, lines 31-38. The deflection force F_i is supplied via movement of the deflection portion 190 as illustrated by arrow a to enlarge the mounting aperture 140 of the clamp as shown below. As described with respect to FIG. 8, disc clamp 136 is in a maximum deflection angle in response to the deflection force F_i imparted by the deflection portion 190 to provide the enlarged aperture 140. Ng, col. 7, lines 40-45.

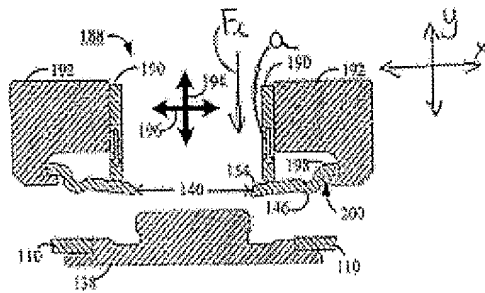


FIG. 8

As shown in FIG. 9 below, the retention portion 192 is lowered as illustrated by arrow b to install the clamp. Arrows a, b shown in FIGS. 8-9 illustrate movement in the same y-direction 194 and not in a first direction and a second direction generally transverse to the first direction to provide an outward force in a first direction and a clamping force in a second direction generally transverse to the first direction as required by claim 21.

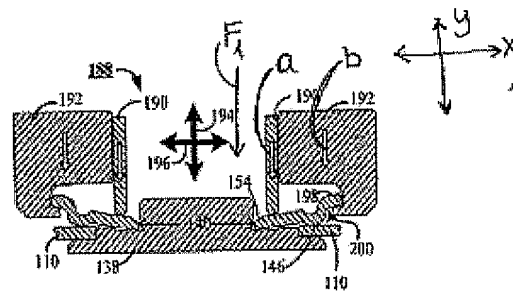


FIG. 9

ii. *FIGS. 10-12 do not teach the clamping force in the second direction as required by claim 21.*

FIG. 10 below discloses retraction of the deflection portion 190 as illustrated by arrow c. The deflection portion 190 is retracted as illustrated by arrow c to develop the clamping force between the clamp 130 and the motor hub 138 to install the clamp. Ng, col. 7, lines 52-62. In particular “upon release of the deflection portion 190 . . . the peripheral portion 142 of the disc clamp 136 is restrained by the motor hub 138 and precluded from returning to its free state” to install the clamp. Ng, col. 7, lines 52-63.

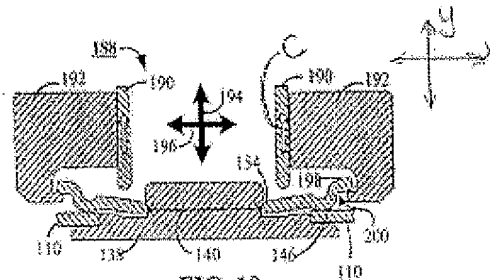


FIG. 10

As shown, deflection portion 190 in FIG. 10 is moved in a reverse direction along the y-axis as illustrated by arrow c to install the clamp. Deflection portion 190 is not moved in a second direction transverse to the first direction (e.g. direction a) to provide the clamping force in a second direction transverse to the first direction as required by claim 21.

FIG. 11 below illustrates release of the clamp 130 by the retention portion 192 as illustrated by arrow d. Retraction of the retention portion 192 as illustrated by arrow d is not a clamping force to disengage the inner portion of the clamp thereby reducing the opening to install the clamp over the flange as claimed.

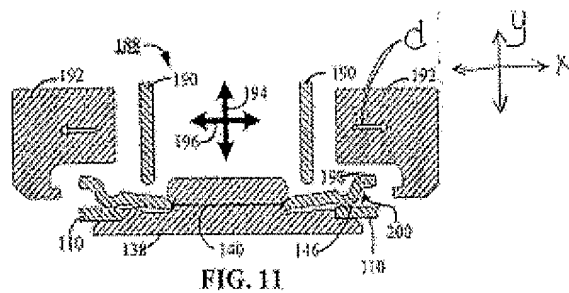


FIG. 11

FIG. 12 shown below illustrates retraction of the deflection portion 190 and retention portion 192 as illustrated by arrows c and e. As shown, arrows c and e are both in the reverse direction (along y-axis 194) not in transverse direction relative to direction a. Thus FIG. 12 does not teach a clamping force in the second direction generally transverse to the first direction as required by claim 21.

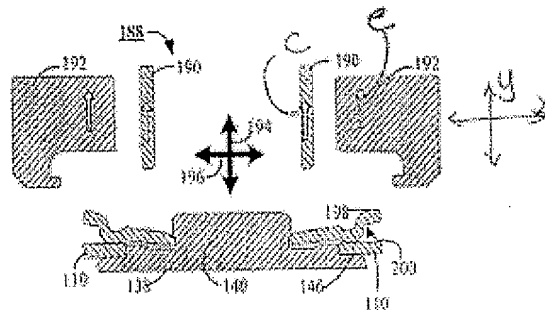


FIG. 12

iii. There is no support for the Examiner's position that FIG. 9 of Ng discloses a clamping force in the x-direction as set forth in the Office Action.

As discussed above, each of the recited claim elements must be expressly or inherently taught by the prior art reference. On page 5, the Office Action states that in FIG. 9, “[a]fter the clamp is supplied outward force [sic] in the y-direction, the clamp is fitted by supplying the clamping force in the second x-direction, which the clamp is fitted in the slot as shown in FIG. 10”. It appears that on this basis, the Examiner concludes that the step of supplying the clamping force in the second direction generally transverse to the first direction as claimed is taught by Ng.

Neither FIG. 9 nor FIG. 10 expressly or inherently disclose that “the clamp is fitted by supplying a clamping force in the second x-direction” as set forth on page 5 of the Office Action. FIG. 9 illustrates movement of the deflection portion 190 and the retention portion 192 in the y-direction as illustrated by arrows a and b to lower and install the clamp. In FIG. 9, arrows a and b are in the y-direction not the x-direction transverse to the y-direction. As shown and described, movement of the deflection portion 190 as illustrated by arrow a enlarges the opening to fit the clamp about a rim of the motor hub 138. Thereafter, the force is released as illustrated by arrow c in FIG. 10 to allow the clamp to press against a retention surface of the motor hub 138 to install the clamp. Retraction of the deflection portion 190 as illustrated by arrow c is in the y-direction not the x-direction transverse to the y-direction.

FIG. 9 of Ng illustrates steps to install clamp 136 illustrated in plan view in FIG. 2. As shown in FIG. 2, clamp 136 is formed of a rigid circular ring having a central opening as 140.

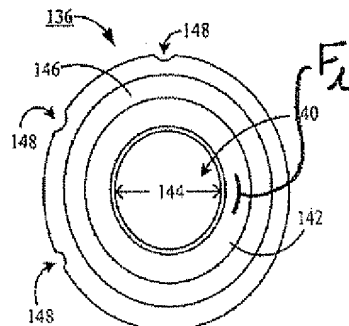


FIG. 2

As previously described, the deflection portion 190 applies a deflection force F_i to the peripheral portion 142 of the ring to bias the peripheral portion 142 outwardly to enlarge the opening 140 to fit over the outside diameter of motor hub 138. Once the deflection force is released, the deflected portion of the disc clamp is biased inwardly in the opposite direction (e.g. direction c) and pressingly engages the motor hub 138 to install the clamp. Ng, col. 4, lines 22-26 and col. 7, lines 52-64. As described, the clamping force is developed by the deflection of the peripheral portion of the clamp in the y-direction and not by a force supplied in a second x-direction as set forth on page 5 of the Office Action.

To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient'. MPEP § 2112. The Office Action does not provide any evidence to support that "[a]fter the clamp is supplied outward force in the first y-direction 194, the clamp is fitted by supplying the clamping force in the second x-direction" as set forth on page 5 of the Office Action. As discussed above, FIG. 9 does not disclose a clamping force in a second x-direction and the Office Action provides no evidence that persons of ordinary skill in the art would understand that a force in the x-direction is taught.

As illustrated above, FIGS. 8-12 illustrates a deflection force in a first direction but do teach a **clamping force in a second direction generally transverse to the first direction to disengage the inner portion of the clamp from the assembly tool, thereby reducing the opening to install the clamp over a flange** as required by claim 21. Claims 23, 25, 27, 29, 32-33 are dependent upon claim 21 and are allowable as discussed above.

III. Claim 26 is not anticipated by Ng

Claim 26 is rejected under 35 U.S.C. § 102(e) as being anticipated by Ng, U.S. Patent No. 7,215,509. Claim 26 recites as follows:

supplying an outward force in a first direction to an inner portion of a clamp via an assembly tool; and
releasing the clamp from the assembly tool by **supplying a clamping force in a second direction towards a clamping interface, where the second direction is different from the first direction** to install the clamp into a recessed groove of the clamping interface.

Claim 26 is similarly rejected on the basis that Ng teaches supplying an outward force in a first direction (194 – downward Y-direction) and supplying a clamping force in a second direction (196, X-direction) generally transverse to the first direction to disengage the inner portion of the clamp from the assembly tool, thereby reducing the opening to install the clamp over a flange of a clamping interface as shown in FIGS. 10-12 (see also col. 7, lines 13 – col. 8, line 38) as previously stated with respect to claim 21 and on the basis that “the clamping force is supplied while inner portion (190) and outer tools (192) engages the inner and outer portions of the clamp as shown in FIG. 8.” Office Action, page 3.

On its face, the rejection fails to consider the actual claim language of claim 26 where the clamping force is supplied in a second different direction towards the clamping interface and thus on its face, the rejection fails to set forth a *prima facie* to reject claim 26. Ng does not teach the required clamping force in the second direction towards the clamping interface where the second direction is different from the first direction to install the clamp into a recessed groove of the clamping interface as claimed.

- i. **FIGS. 8-9 do not teach the clamping force in the second direction as required by claim 24**

As discussed above, FIG. 8-9 illustrates application of deflection force F_i via movement of the deflection portion 190 in a y-direction as illustrated by arrow a.

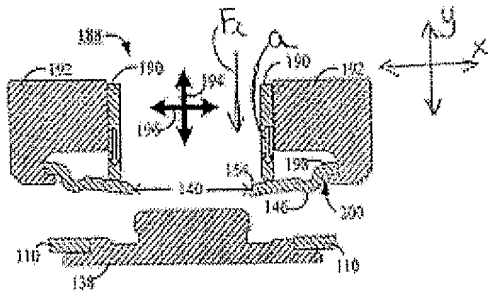


FIG. 8

As shown in FIG. 9 below, the retention portion 192 is lowered (as illustrated by arrow b) in the same direction as illustrated by arrow a and not a different direction. Arrows a, b shown in FIGS. 8-9 illustrate movement along the same y-axis 194 in the same direction and not in first direction and a second direction different from the first direction to provide an outward force in a first direction and a clamping force in a second direction towards the clamping interface different from the first direction as required by claim 26.

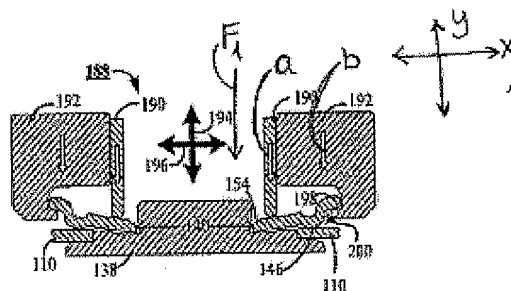


FIG. 9

ii. *FIGS. 10-12 do not teach the clamping force in the second direction as required by claim 26.*

FIG. 10 below discloses retraction of the deflection portion 190 as illustrated by arrow c. Arrow c is directed away from the clamping interface or motor hub 138 not toward the clamping interface. Thus retraction of the retention portion 192 does not teach a clamping force in the second direction toward the clamping interface different from the first direction as required by claim 26.

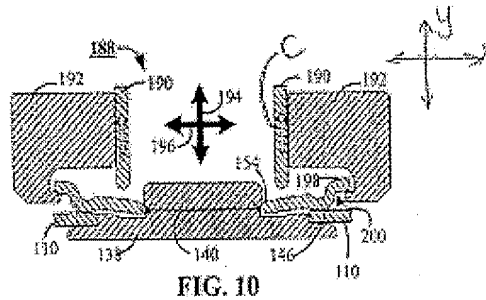


FIG. 11 illustrates retraction of the retention portion 192 as illustrated by arrow d to release the disc clamp. Arrow d is directed away from the clamping interface not toward the clamping interface. Thus, retraction of the retention portion 192 does not teach a clamping force in the second direction toward the clamping interface different from the first direction as required by claim 26.

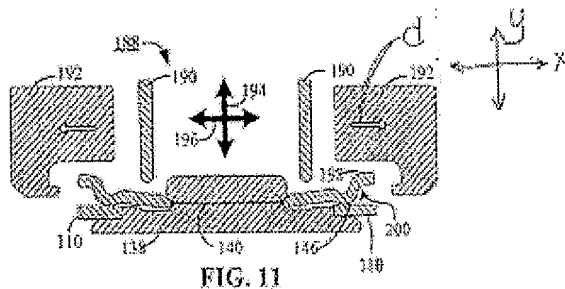


FIG. 12 shown below illustrates retraction of the deflection portion 190 and retention portion 192 as illustrated by arrows c and e. As shown, arrows c and e are directed away from and not towards the clamping interface and thus do not teach a clamping force in the second direction toward the clamping interface different from the first direction as required by claim 26.

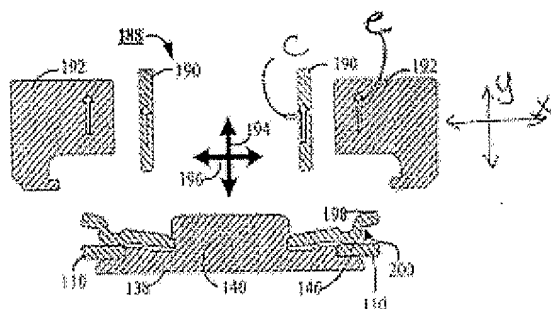


FIG. 12

iii. There is no support for the Examiner's position that FIG. 9 of Ng discloses a clamping force in the x-direction as set forth in the Office Action.

As previously discussed, FIG. 9 of Ng does not disclose a clamping force in the x-direction as set forth on page 5 of the Office Action. Ng discloses a clamping force developed by the deflection of the peripheral portion of the clamp in the y-direction and not by a force supplied in a second x-direction as set forth on page 5 of the Office Action.

Since Ng fails to disclose each of the recited claim elements as discussed above, the Office Action fails to set forth a *prima facie* basis to reject claim 26. Claims 22 and 38 are dependent upon claim 26 and are allowable as discussed above.

IV. Claim 41 is not anticipated by Ng

Claim 41 is dependent upon claim 26 and is also rejected under 35 U.S.C. § 102(e) as being anticipated by Ng, U.S. Patent No. 7,215,509. Claim 41 provides wherein the second direction is generally transverse to the first direction. Claim 41 is not anticipated by Ng for the

reasons discussed above with respect to claim 26.

Further as previously discussed, deflection portion 190 and retention portion 192 are moved toward the motor hub 138 as illustrated by arrows a and b orientated in the same direction as shown in FIG. 9. Arrow b is not transverse to arrow a and thus clearly Ng does not teach **a clamping force in a second direction towards a clamping interface, where the second direction is transverse to the first direction** to install the clamp into a recessed groove of the clamping interface as required by claim 41.

V. Claim 42 is not anticipated by Ng

Claim 42 is dependent upon claim 26 and is also rejected under 35 U.S.C. § 102(e) as being anticipated by Ng, U.S. Patent No. 7,215,509. Claim 42 recites wherein the step of supplying the outward force comprises **moving the assembly tool in the second direction** to engage the inner portion of the clamp along a sloped surface of the assembly tool **to supply the outward force** to the inner portion of the clamp **in the first direction**.

Claim 42 is rejected as discussed with respect to claim 26 above and further on the basis that “the inner portion of the clamp is engaged along a sloped surface of an assembly tool (192) to supply the outward force to the inner portion of the clamp prior to supplying the clamping force as shown in FIG. 7.” On its face, the rejection fails to consider the required claim elements or language since claim 42 requires **moving the assembly tool in the second direction** to supply the **outward force in the first direction**. Clearly, the Office Action fails to set forth a *prima facie* basis to reject claim 42 since the Office Action fails to consider each of the recited claim elements.

As shown above with reference to FIGS. 8-9, Ng discloses movement of deflection portion 190 in a first direction as illustrated by arrow a to supply force F_i in the first direction as illustrated by arrow a. The direction of force F_i is the same as the direction of movement of the deflection portion 190. Ng does not teach movement of deflection portion 190 in a direction traverse to the y-direction to supply the force F_i in the y-direction. Clearly claim 42 is not anticipated by Ng.

VI. Claim 43 is not anticipated by Ng

Claim 43 is dependent upon claim 26 and is also rejected under 35 U.S.C. § 102(e) as being anticipated by Ng, U.S. Patent No. 7,215,509. Claim 43 recites engaging an outer portion of the clamp and supplying the clamping force in the second direction to an intermediate portion of the clamp spaced from inner and outer edges of the clamp. Claim 43 is rejected as discussed above with respect to claim 26 and further on the basis that “the clamping force in the second direction is supplied to an intermediate portion of the clamp spaced from inner and outer edges of the clamp as shown in FIGS. 7 and 8”. Office Action page 4.

Claim 43 is dependent upon claim 26, which requires a first force in a first direction and a second force in a second direction different from the first direction and towards the clamping interface and further that the clamping force in the second direction is supplied to an intermediate portion of the clamp spaced from inner and outer edges of the clamp.

Movement of the deflection portion 190 shown in FIGS. 8-9 provides a force in a first direction as previously discussed. Ng does not disclose a clamping force in a second direction different from the first direction where the clamping force in the second direction is supplied to an intermediate portion of the clamp spaced from the inner and outer edges of the clamp as required by claim 43.

VII. Claim 28 is not anticipated by Ng

Claim 28 is rejected under 35 U.S.C. § 102(e) as being anticipated by Ng, U.S. Patent No. 7,215,509.

Claim 28 recites a method comprising *inter alia*:

supplying an outward force in a first direction to an inner portion of the clamp;
supplying a clamping force in a second direction to the clamp along an inverted portion of the clamp spaced from inner and outer edges of the clamp, where the second direction is different from the first direction and in a direction towards the spindle assembly.

Claim 28 is similarly rejected on the basis that Ng teaches supplying an outward force in

a first direction (194 – downward Y-direction) and supplying a clamping force in a second direction (196, X-direction) generally transverse to the first direction to disengage the inner portion of the clamp from the assembly tool, thereby reducing the opening to install the clamp over a flange of a clamping interface as shown in FIGS. 10-12 (see also col. 7, lines 13 – col. 8, line 38) as previously stated with respect to claim 21 and that “an inverted spring portion (a sloped tip portion) of the clamp is snap fitting [sic] into the groove of the clamping interface as shown in FIG. 9”. Office Action, page 3.

Ng does not teach the required clamping force in the second direction different from the first direction in a direction towards the spindle assembly as required by claim 28 for the reasons discussed above with respect to claim 26 and withdrawal of the rejection is respectfully requested. Claims 31 and 35 are dependent upon claim 28 and are also allowable as discussed above.

VIII. Claim 44 is not anticipated by Ng .

Claim 44 is dependent upon claim 28 and is also rejected under 35 U.S.C. § 102(e) as being anticipated by Ng, U.S. Patent No. 7,215,509. Claim 44 recites wherein the outward force is supplied via an assembly tool movable in a second direction toward the spindle assembly and was rejected as discussed above with respect to claim 28 and further on the basis that “the clamping force is supplied via an assembly tool movable in the second direction toward the spindle assembly as shown in FIGS. 7-9”. Office Action, page 4. As previously discussed with respect to claim 42, Ng does not expressly nor inherently teach where the outward force is supplied in the first direction via movement of an assembly tool in the second direction as claimed.

IX. CONCLUSION

The Office Action fails to establish that the claimed subject matter is expressly or inherently taught by Ng and thus withdrawal of the rejection of claim 21-23, 25-29, 32, 33, 35, 38 and 41-44 under 35 U.S.C. § 102(e) is respectfully requested. Additionally, the Office Action

fails to set forth a *prima facie* basis to object to claims 17-19 and 31 under 35 U.S.C. §112 and accordingly allowance thereof is respectfully requested.

Respectfully submitted,

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Claim Appendix

Claims 1-16 (cancelled)

17. The method of claim 21 and further comprising:

engaging the inner portion of the clamp through a slot between flange segments of the clamping interface; and
applying a force to the inner portion of the clamp to remove the clamp from the clamping interface.

18. The method of claim 21 and comprising:

aligning a tool relative to a slot between flange segments of the clamping interface;
engaging a portion of the clamp with the tool through the slot; and
using the tool to remove the clamp.

19. The method of claim 18 wherein the clamp includes a plurality of tabs and engaging the portion of the clamp with the tool engages at least one of the plurality of tabs .

20. (cancelled).

21. A method comprising:

supplying an outward force in a first direction via contacting engagement with an assembly tool against an inner portion of a clamp to enlarge an opening defined by the clamp; and

supplying a clamping force in a second direction generally transverse to the first direction to disengage the inner portion of the clamp from the assembly

tool, thereby reducing the opening to install the clamp over a flange of a clamping interface.

22. The method of claim 26 wherein the releasing step comprises :

 snap fitting an inverted spring portion of the clamp into the recessed groove of the clamping interface.

23. The method of claim 21 wherein supplying the outward force comprises:

 engaging the inner portion of the clamp along a sloped surface of the assembly tool to supply the outward force in the first direction to the inner portion of the clamp prior to supplying the clamping force.

24. (cancelled)

25. The method of claim 23 wherein the clamp includes a plurality of tabs spaced about an inner circumference of the clamp and the assembly tool engages one or more of the plurality of tabs to bias an inverted spring portion of the clamp outwardly to install the clamp over the flange of the clamping interface.

26. A method comprising;

 supplying an outward force in a first direction to an inner portion of a clamp via an assembly tool; and

 releasing the clamp from the assembly tool by supplying a clamping force in a second direction towards a clamping interface, where the second direction is different from the first direction to install the clamp into a recessed groove of the clamping interface.

27. The method of claim 21 wherein the clamping interface is formed on a spindle assembly and comprising:

loading one or more discs on the spindle assembly prior to supplying the clamping force to install the clamp.

28. A method comprising:

positioning a clamp proximate to a spindle assembly;
supplying an outward force in a first direction to an inner portion of the clamp;
supplying a clamping force in a second direction to the clamp along an inverted portion of the clamp spaced from inner and outer edges of the clamp,
where the second direction is different from the first direction and in a direction towards the spindle assembly; and
installing the inverted portion of the clamp into a recessed groove of the spindle assembly.

29. The method of claim 21 and comprising:

supplying the outward force to the inner portion of the clamp prior to supplying the clamping force.

30. (cancelled).

31. The method of claim 28 comprising:

installing one or more discs on the spindle assembly prior to supplying the clamping force.

32. The method of claim 23 wherein the supplying the clamping force is characterized by:

releasing the clamp from the assembly tool to snap fit the clamp into a groove of the clamping interface by supplying the clamping force step.

33. The method of claim 21 and comprising:

supporting at least one disc on a ledge surface of the clamping interface; and
snap fitting the clamp into a groove of the clamping interface having a surface
recessed below the ledge surface of the clamping interface by the
supplying the clamping force step.

34. (cancelled).

35. The method of claim 28 wherein the first direction is generally transverse to the second direction.

36. (cancelled).

37. (cancelled).

38. The method of claim 26 and comprising the step of:

positioning the clamp proximate to the clamping interface prior to supplying the
clamping force.

39. (cancelled).

40. (cancelled).

41. The method of claim 26 wherein the second direction is generally transverse to the first direction.

42. The method of claim 26 wherein the step of supplying the outward force comprises moving the assembly tool in the second direction to engage the inner portion of the clamp along a sloped surface of the assembly tool to supply the outward force to the inner portion of the clamp in the first direction.

43. The method of claim 26 and comprising engaging an outer portion of the clamp and supplying the clamping force in the second direction to an intermediate portion of the clamp spaced from inner and outer edges of the clamp.

44. The method of claim 28 wherein the outward force is supplied via an assembly tool movable in the second direction toward the spindle assembly.

Evidence Appendix

There is no evidence submitted.

Related Proceedings Appendix

There are no related proceedings - *none*.